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Reply to: 3460 January 12, 1989

Subject: American beech mortality within the Burner Settlement Opportunity Area

To: District Ranger, Greenbrier Ranger District

Marvin Schuhmann (Assistant Ranger) requested me to provide information on the current impact of beech bark disease on the American beech resource within the Burner Settlement Opportunity Area (OA). We used aerial photography to rate the amount of hardwood mortality in stands with a component of American beech.

Methods: A database was constructed at the Morgantown Field Office which listed all stands within Greenbrier Ranger District with an American beech component. The Burner Settlement OA has American beech located in compartments 77, 90 and 103. The amount of mortality was rated from aerial photography for only those stands which had at least ten square feet per acre of American beech.

High altitude panoramic aerial (1:30,000 scale) color infrared photography was acquired on June 11, 1988. The procedure for aerial photograph interpretation followed Mielke et al. (1984) and Acciavatti and Dropp (1986). Each stand was rated (see Table 1) according to the methods developed by Acciavatti and Dropp (1986).

No ground data was taken to determine the accuracy of the aerial photography interpretation, but good results were achieved within the Gaudineer OA. The Gaudineer OA and the Burner Settlement OA were examined at about the same time by one aerial photograph interpreter. Therefore, the results for the Burner Settlement OA should be as accurate as the Gaudineer OA.

Results and Discussion: Our VIMIS data listed American beech was present within 67 stands (1307 acres) of the Burner Settlement OA. Only 22 stands (438 acres) had at least ten square feet of American beech per acre. Table 2 lists the mortality rating for each of the 22 stands. Six stands had no mortality. Figures 1A - 1D show the distribution of stands classified with light, and moderate mortality. The Burner Settlement OA should be classified in the killing front because beech scale populations have been recorded in the area since 1983, and moderate mortality has begun in some stands (see Figures 1A - 1D and Table 2) (Houston and O'Brien, 1983). Mortality of the American beech will continue over the next ten years.

Recommendations: Beech bark disease mortality will continue to increase within the Burner Settlement OA. The economic impact on the timber resource by the disease will probably not be significant. Beech bark disease may have

an impact on certain wildlife species (such as grouse, turkey, bear and deer) which may depend upon the mast crop. Also, if American beech sprouts from susceptible parents are not removed, then a potential exits in the future to increase the problem caused by this disease (Houston, 1975). The following recommendations (Mielke et al., 1986) should be applied to as many stands as possible:

1. Salvage dead, declining (thin crowned, chlorotic) trees, especially hazard trees.

2. Monitor insect and disease condition.

3. Salvage trees with heavy scale populations and trees with signs of Nectria spp.

4. Treat infested understory or sprouts associated with heavily infested overstory.

5. Leave trees and their root sprouts with little or no scale and no signs of Nectria spp.

Permanent Plots: No beech bark disease permanent plots or red spruce Trend/ Symptomatology plots are located within the Bruner Settlement OA.

Please contact me (304-291-4133) if you have any questions, or need further assistance.

Bill Jackson

William A Jackson
Plant Pathologist
Forest Pest Management

cc: AO, FPM
MNF SO, Timber
D. Houston, NEFES, Hamden
C. Haynes, WV Dept. of Ag.
W. Lesser, WV DNR
W. Jackson

Literature Cited

Acciavatti, Robert E. and Elizabeth R. Dropp. 1986. Beech Bark Disease Damage Evaluations, Bradford Ranger District, Allegheny National Forest, Pennsylvania. Biological Evaluation 3440. USDA Forest Service, Forest Pest Management. 50pp.

Houston, David R. 1975. Beech Bark Disease: The Aftermath Forests Are Structured for a New Outbreak. Journal of Forestry. 73(10): 660-663.

Houston, David R. and James T. O'Brien. 1983. Beech Bark Disease. USDA Forest Service, Forest and Disease Leaflet 75, 8 pp.

Mielke, M. E., W. M. Ciesla, and R. J. Myhre. 1984. Inventory of beech bark disease mortality and decline on the Monongahela National Forest, West Virginia. USDA Forest Service, Forest Pest Management/Methods Application Group, Ft. Collins, CO. Rpt. No. 84-4, 15 pp.

Mielke, Manfred E., David R. Houston and Allan T. Bullard. 1986. Beech Bark Disease Management Alternatives. In: Proceedings Integrated Pest Management Symposium for Northern Forests; 1986 March 24-27; Madison, Wisconsin. pp 272 - 280.

Table 1. Decision criteria for beech bark disease damage classes*/.

BEECH BARK DISEASE DAMAGE INTENSITY CLASS	DESCRIPTION
Light	< 10% OF TREES DEAD AND DYING
Moderate	10 - 25% OF TREES DEAD AND DYING
Severe	> 25% OF TREES DEAD AND DYING

BEECH BARK DISEASE DAMAGE FREQUENCY CLASS	DESCRIPTION
Clustered	< 30% OF STAND AREA
Partial	30 - 60% OF STAND AREA
Widespread	> 60% OF STAND AREA

The damage class for each stand was labeled in Table 2 using the following coding matrix:

CODING MATRIX FOR BEECH BARK DISEASE DAMAGE CLASSES

INTENSITY CLASS	CLUSTERED	PARTIAL	WIDESPREAD
Light	LC	LP	LW
Moderate	MC	MP	MW
Severe	SC	SP	SW

*/ Taken from Acciavatti and Dropp (1986). The beech bark disease damage frequency class "Clustered" was originally referred to as "Scattered".

Table 2. Damage classes*/ for stands**/ with ten square feet per acre of American beech in compartments 77, 90, and 103, Burner Settlement Opportunity Area, Greenbrier Ranger District, Monongahela National Forest, 1988.

Damage Compartment	Stand	Acres	Total Stand Basal Area (sq. ft. / ac.)	Total American Beech Basal Area (sq. ft. / ac.)	Class
77	4	44	160	25	LW
	5	6	130	15	none
	10	16	110	10	LP
	11	18	102	18	MP
	12	9	180	29	MP
	13	14	100	22	LP
	15	26	150	12	LC
	17	12	140	10	LP
	18	61	140	31	MW
	36	17	110	17	LP
	38	14	140	15	LC
	40	2	80	30	none
	44	13	140	34	MW
	47	10	170	22	none
	48	10	170	14	LC
	53	38	170	20	LP
	54	13	180	12	LW
	56	13	130	10	none
90	11	10	120	14	none
	31	38	140	10	LP
	49	10	120	10	none
103	10	44	140	18	LC

*/ See Table 1 for damage class codes.

**/ Stand acres and basal area estimates taken from VIMIS.

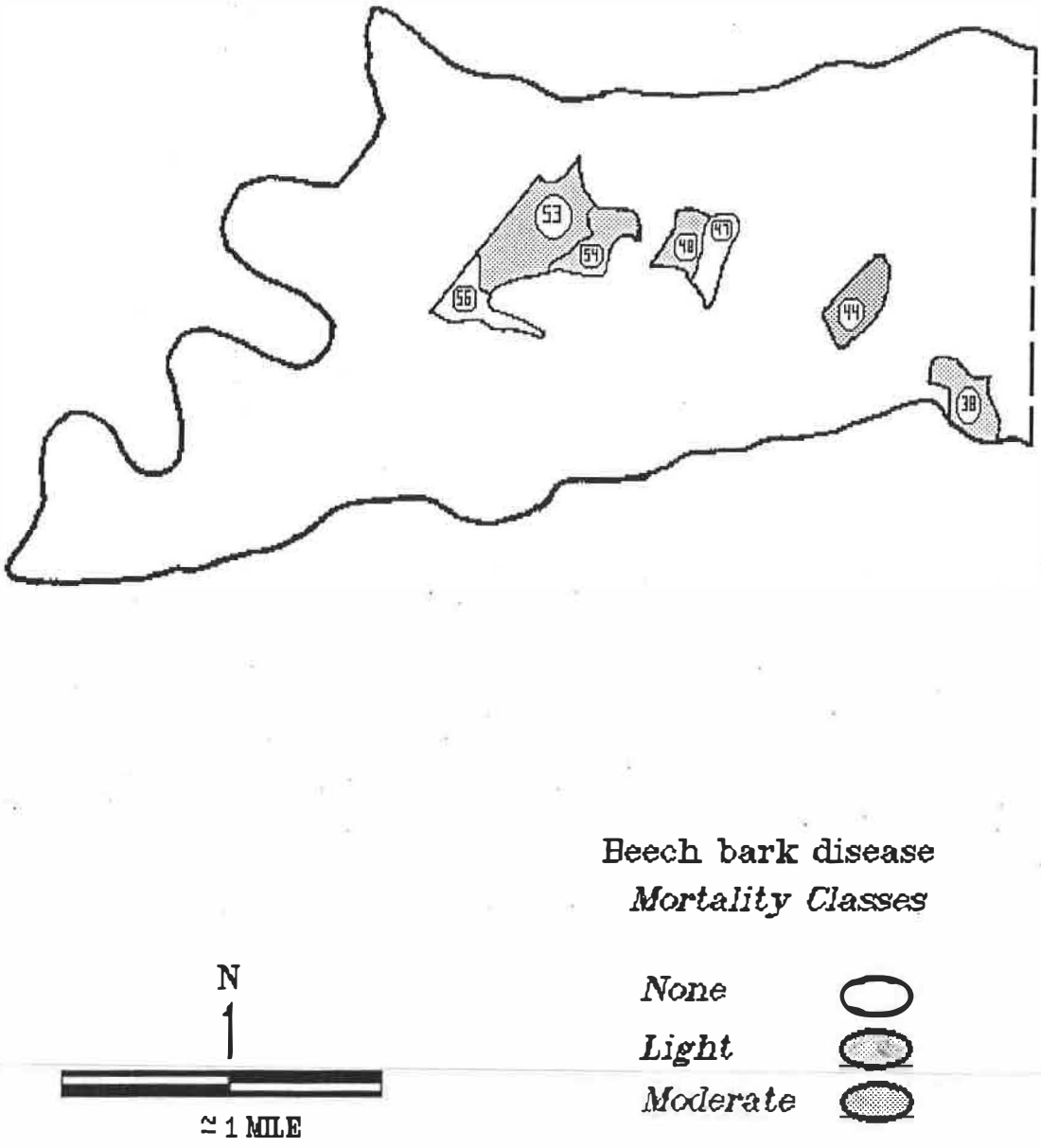


Figure 1A. Stands with hardwood mortality in Compartment 77 (western half), Greenbrier Ranger District, 1988.

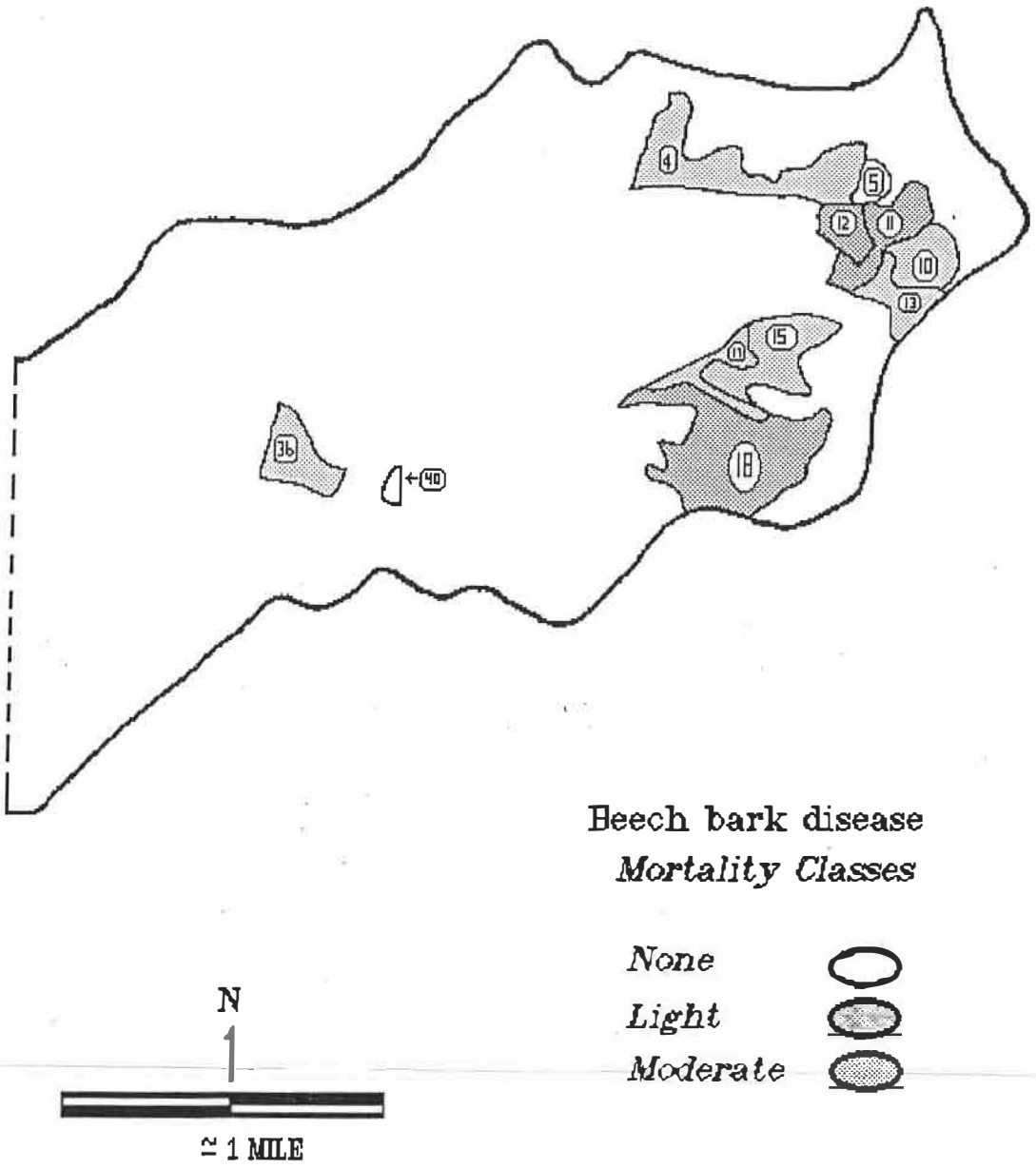
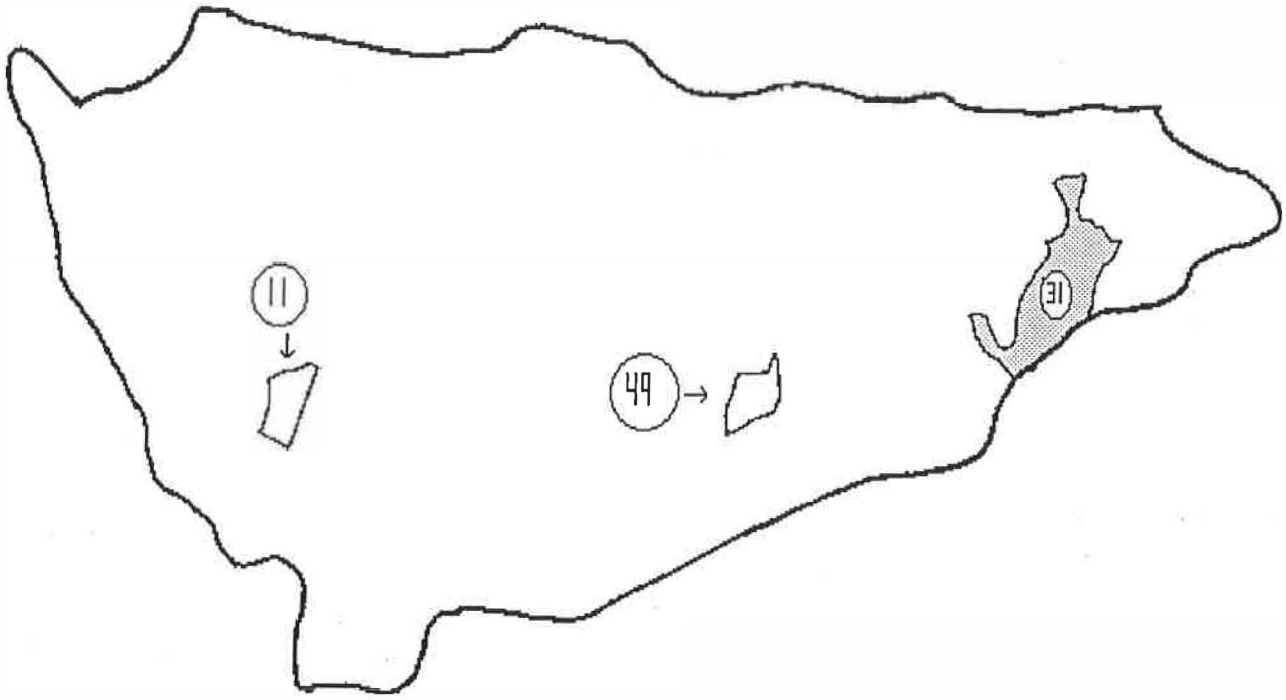


Figure 1B. Stands with hardwood mortality in Compartment 77 (eastern half), Greenbrier Ranger District, 1988.



Beech bark disease
Mortality Classes

None

Light

N

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Figure 1C. Stands with hardwood mortality in Compartment 90, Greenbrier Ranger District, 1988.

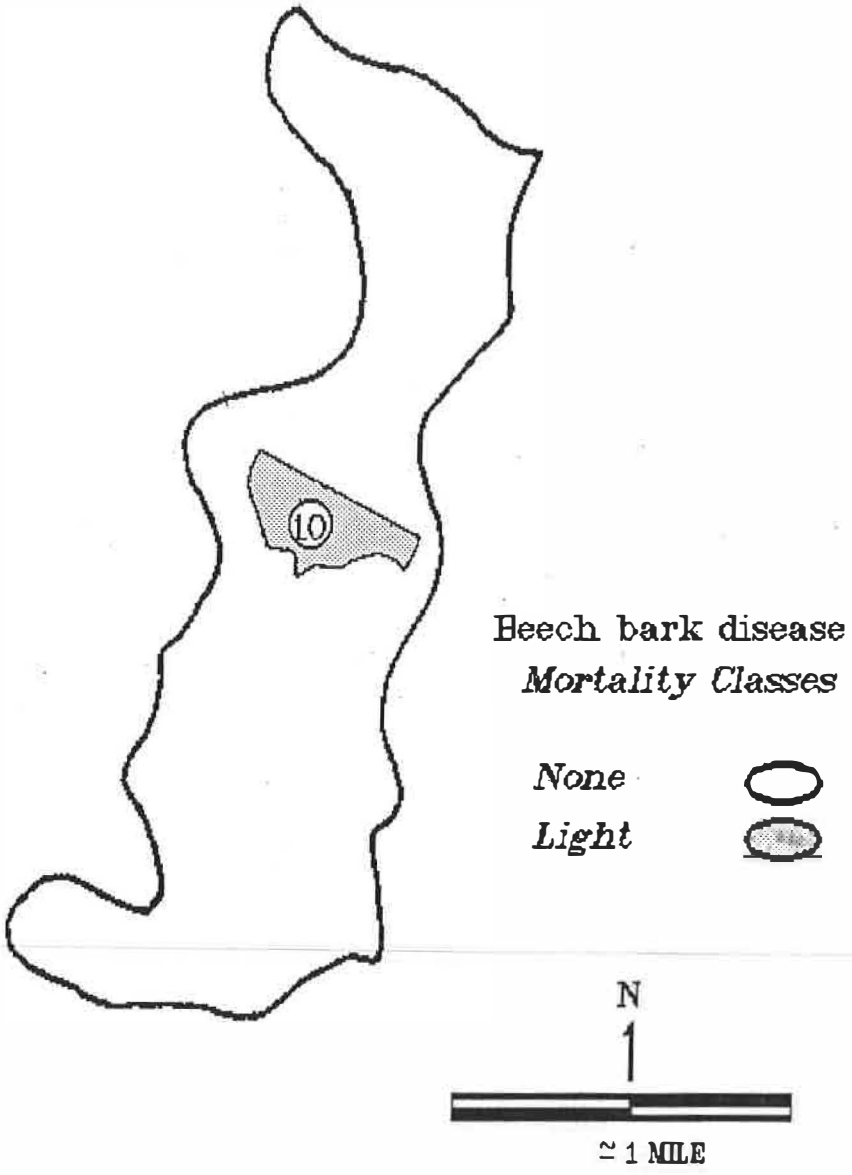

Figure 1D. Stands with hardwood mortality in Compartment 103, Greenbrier Ranger District, 1988.